Building the Analytical Bridge From Mission Utility for the Trainer/Warfighter to the Tester/Technologist

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19 August 1999

Presented at "Testing And Training: A National Partnership 2nd Annual Symposium & Exhibition," held at the Double Tree Orlando Resort and Conference Center, Orlando, FL, 17-19 August 1999.

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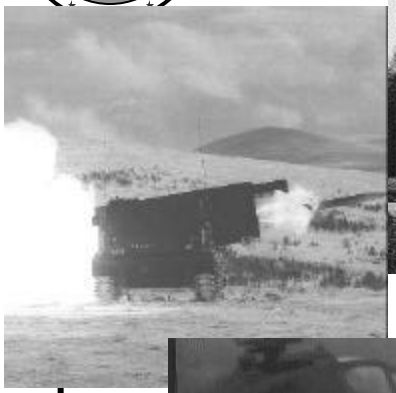
Platform Task to Utility

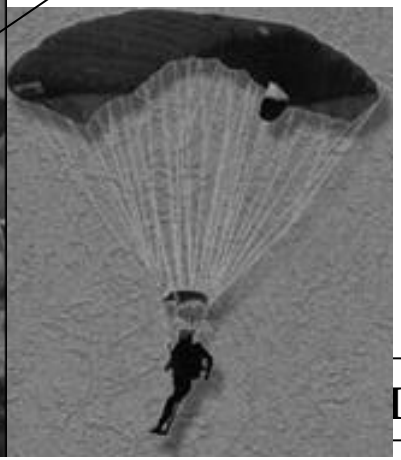
ACQUIRE



ACQUIRE

ACQUIRE

COMMO



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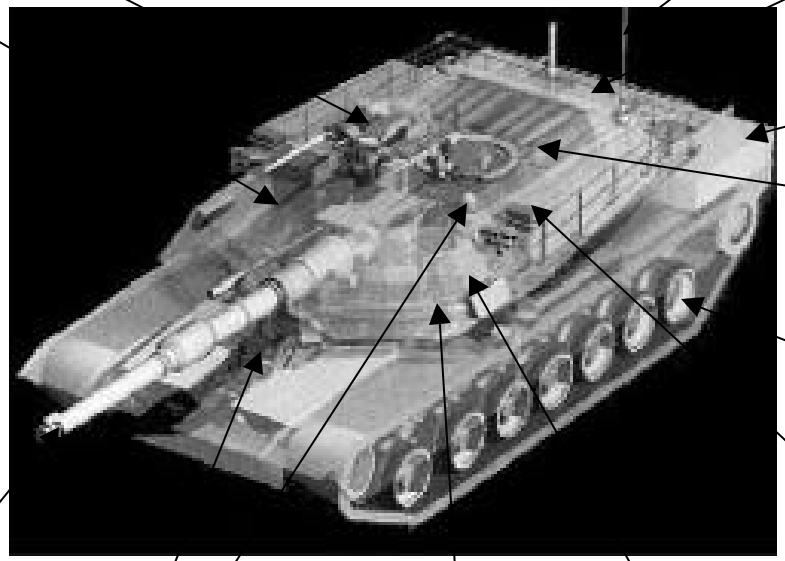
Platform Configuration to Capability



- Commo Equipment
- Secondary Armament
- Engine Compartment
- Early Warning Sensors (LWR, RWR, MWR)
- Fuel
- **Move**
- Ammo Compartment
- **Shoot**
- Wheels/Track
- **Communicate**
- Commo Equipment
- Target Acquisition/Engagement Sights
- Main Armament
- Crew
- Millimeter Wave Radar Ant.

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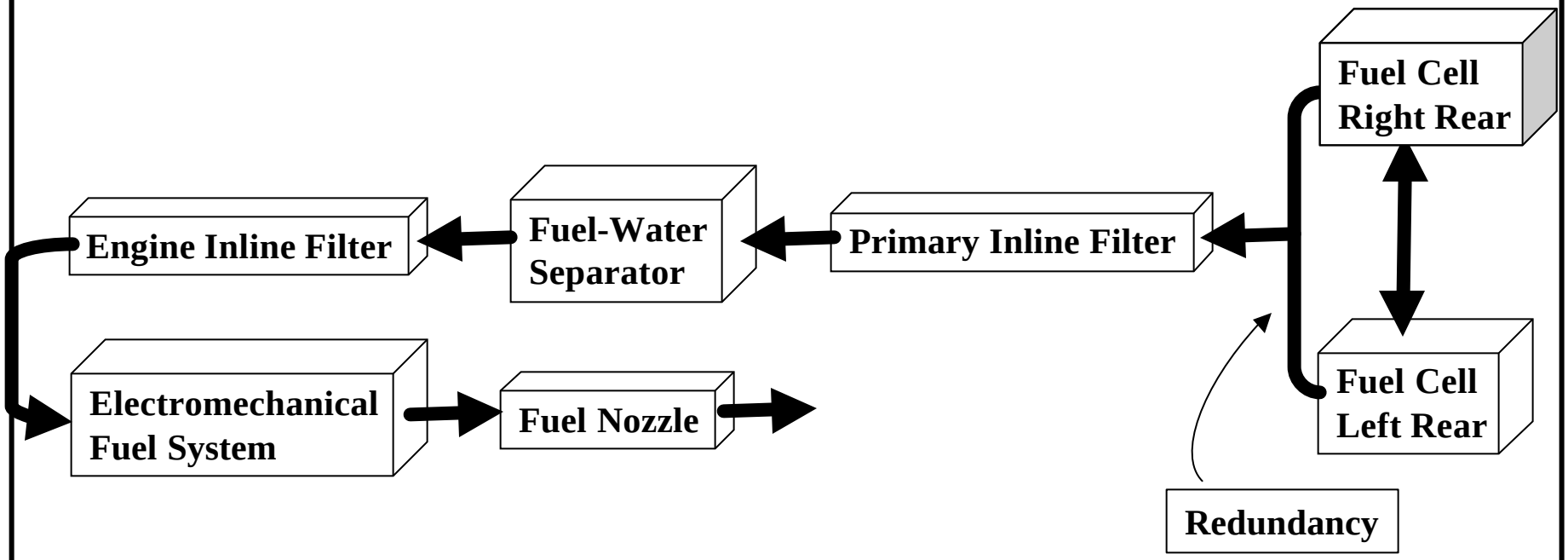
Deactivation Diagram (Fault Tree)
Fuel Supply System

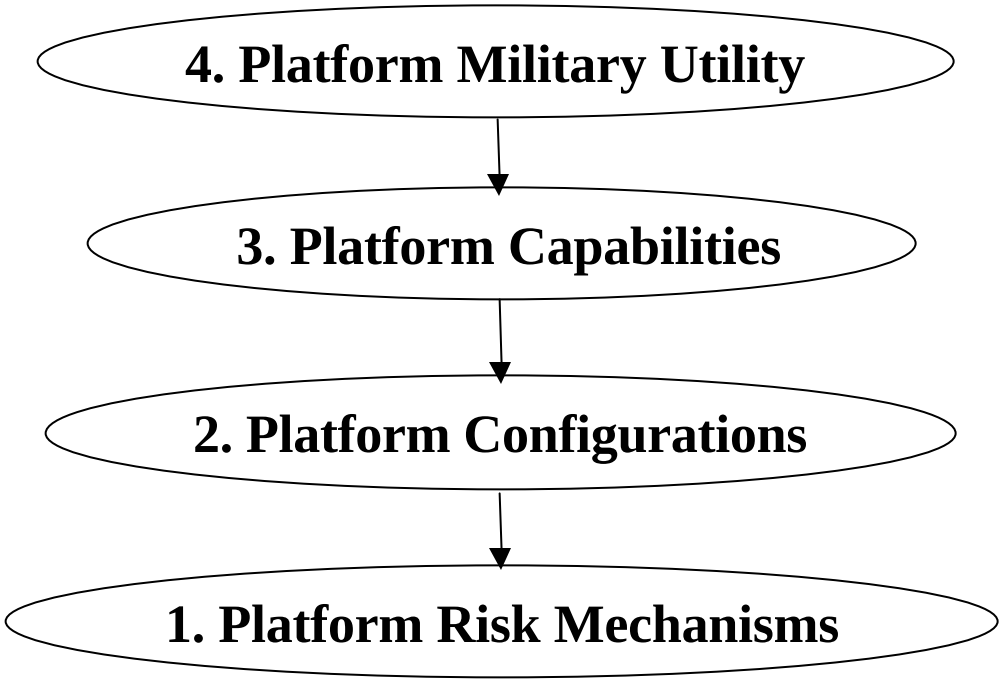


Component Risk Mechanisms

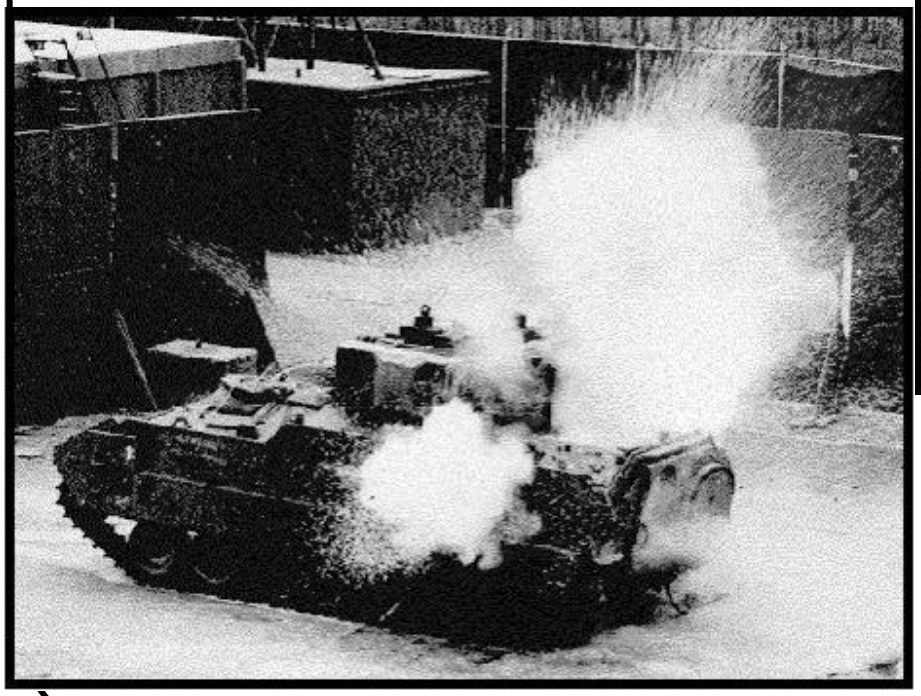
(Quasi-) Perm Damage	Temp Damage	Comp Repair/Fix
Ballistic	Electronic Jamming	Battle Damage Repair
Chemical	Cosite Interference	Resupply
Laser		Sleep+
Directed Energy		
High-Pwr Laser		
Nuclear		
Physics of Failure		
Logistics Burdens (Fuel, Ammo)		
Reliability		
Fair Wear & Tear		
Fatigue+		
Heat Stress+		

+ Personnel Related

Top-Down Analysis Framework



Risk Example: Ballistic Threats



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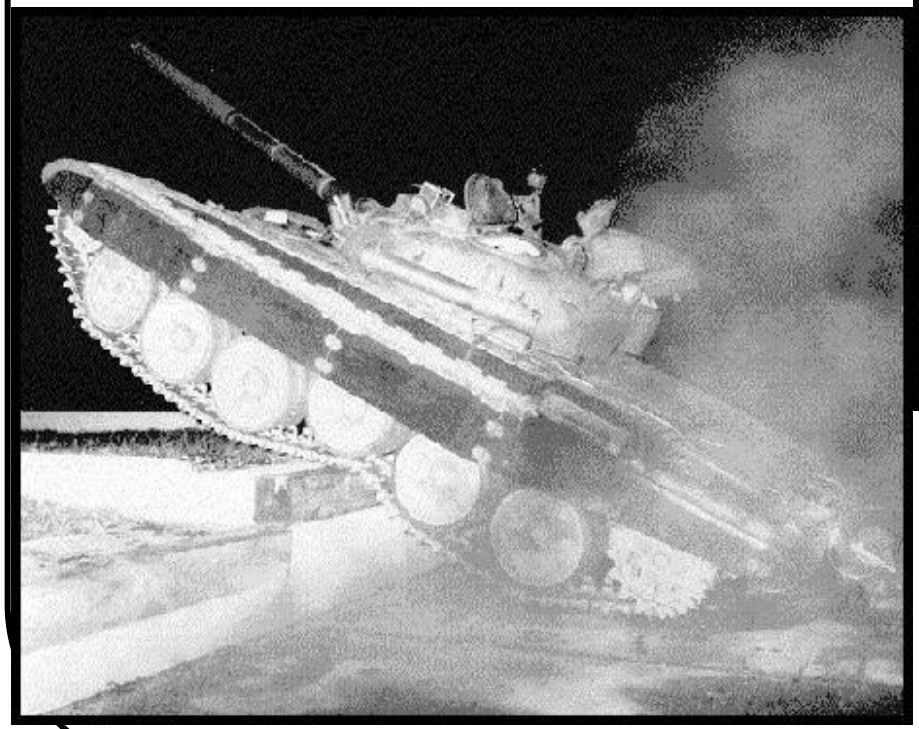
Performance Evaluation



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Utility Assessment

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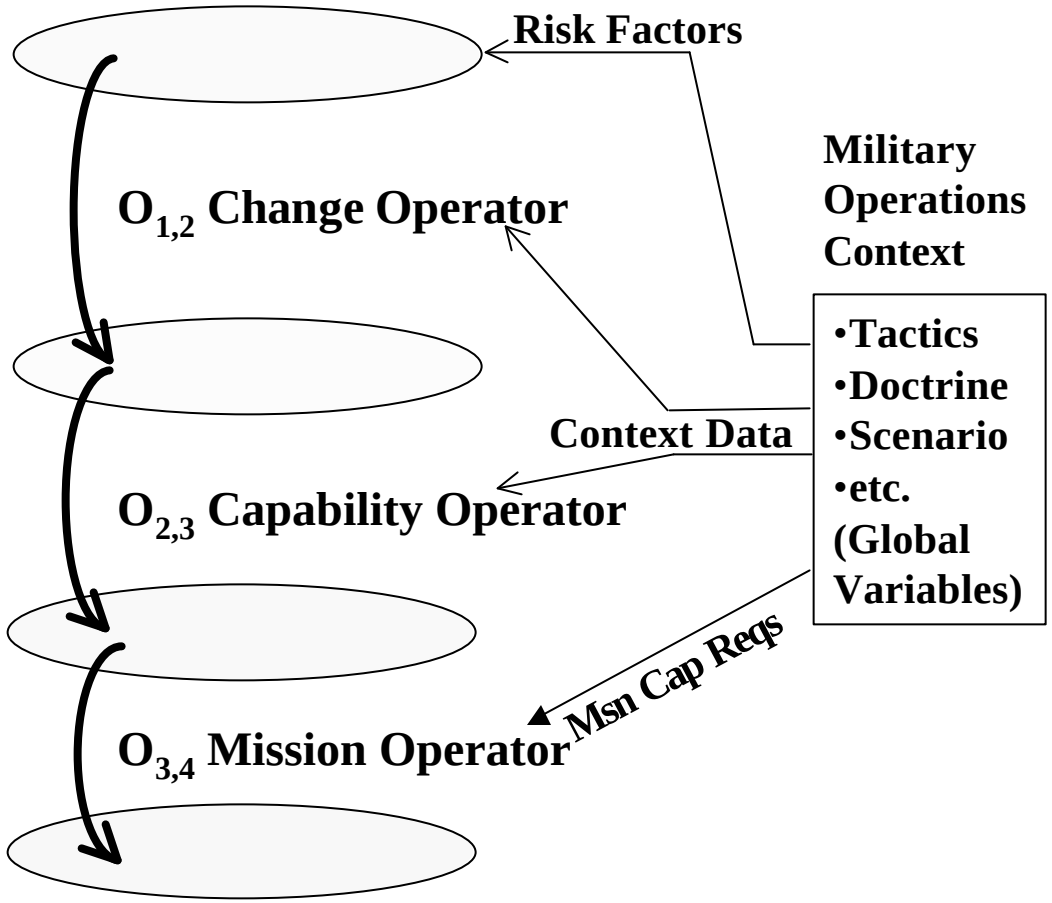
Mission-Based Acquisition Strategy

Level 1] - Initial Conditions

Level 2] - Platform Configuration Status

Level 3] - Platform Capability Status

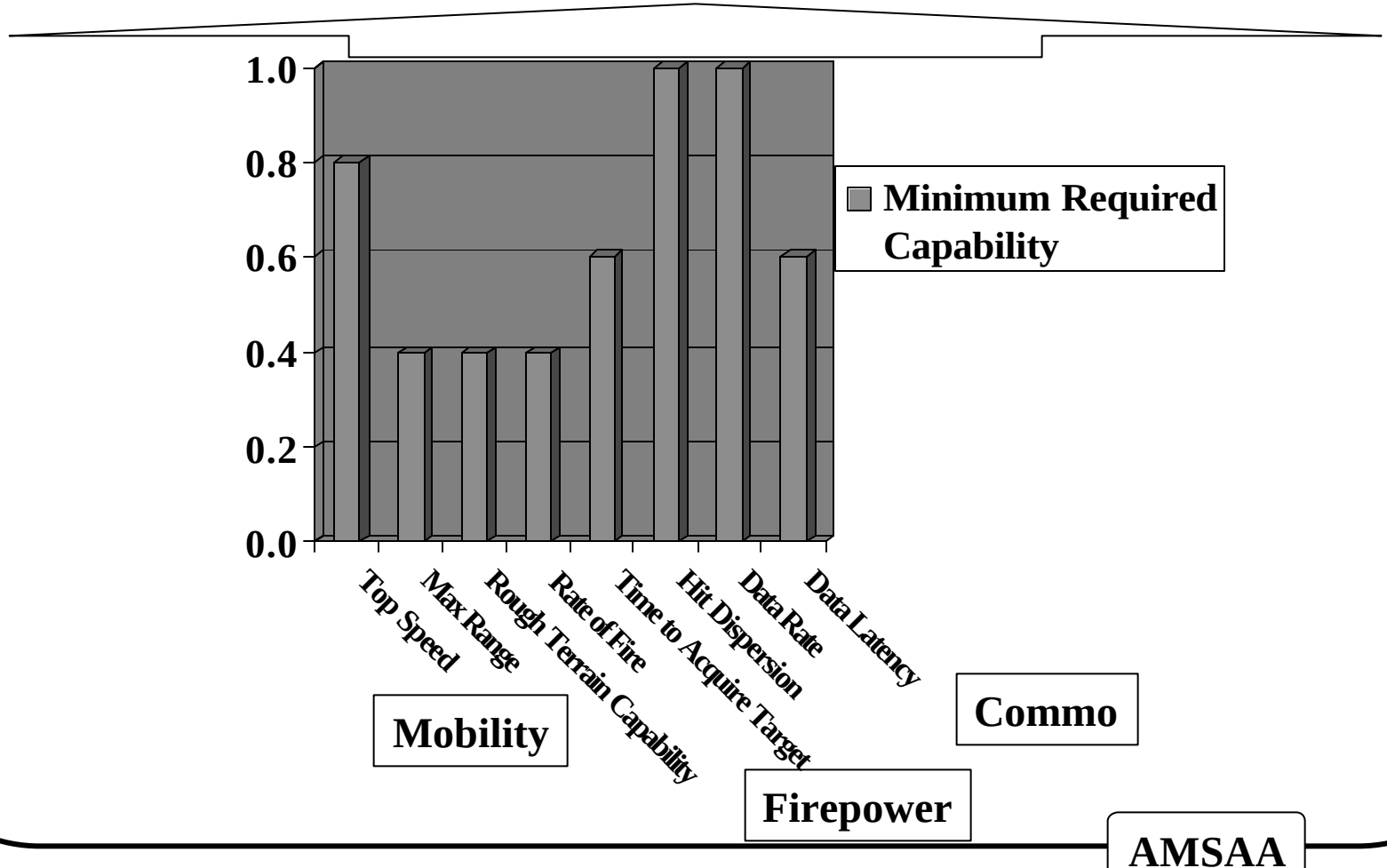
Level 4] - Mission Outcomes Status



The Fourth Dimension
(Mission Scripting/Decomposition)

Mission Script (Time →)

Start | Tasks 1 | Tasks 2 | Tasks n | Tasks n | Tasks n | Tasks n | Tasks n | **Finish**



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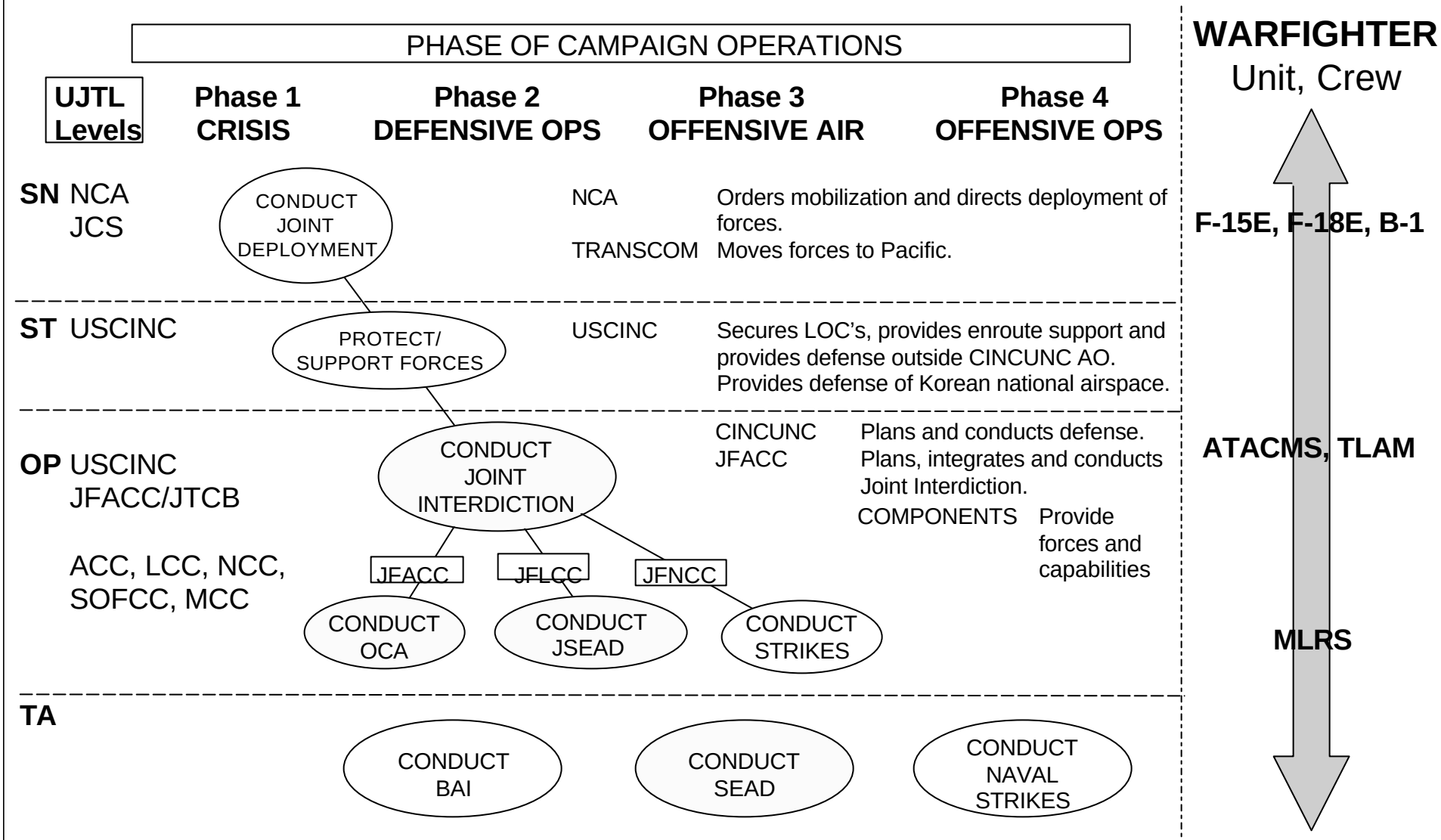
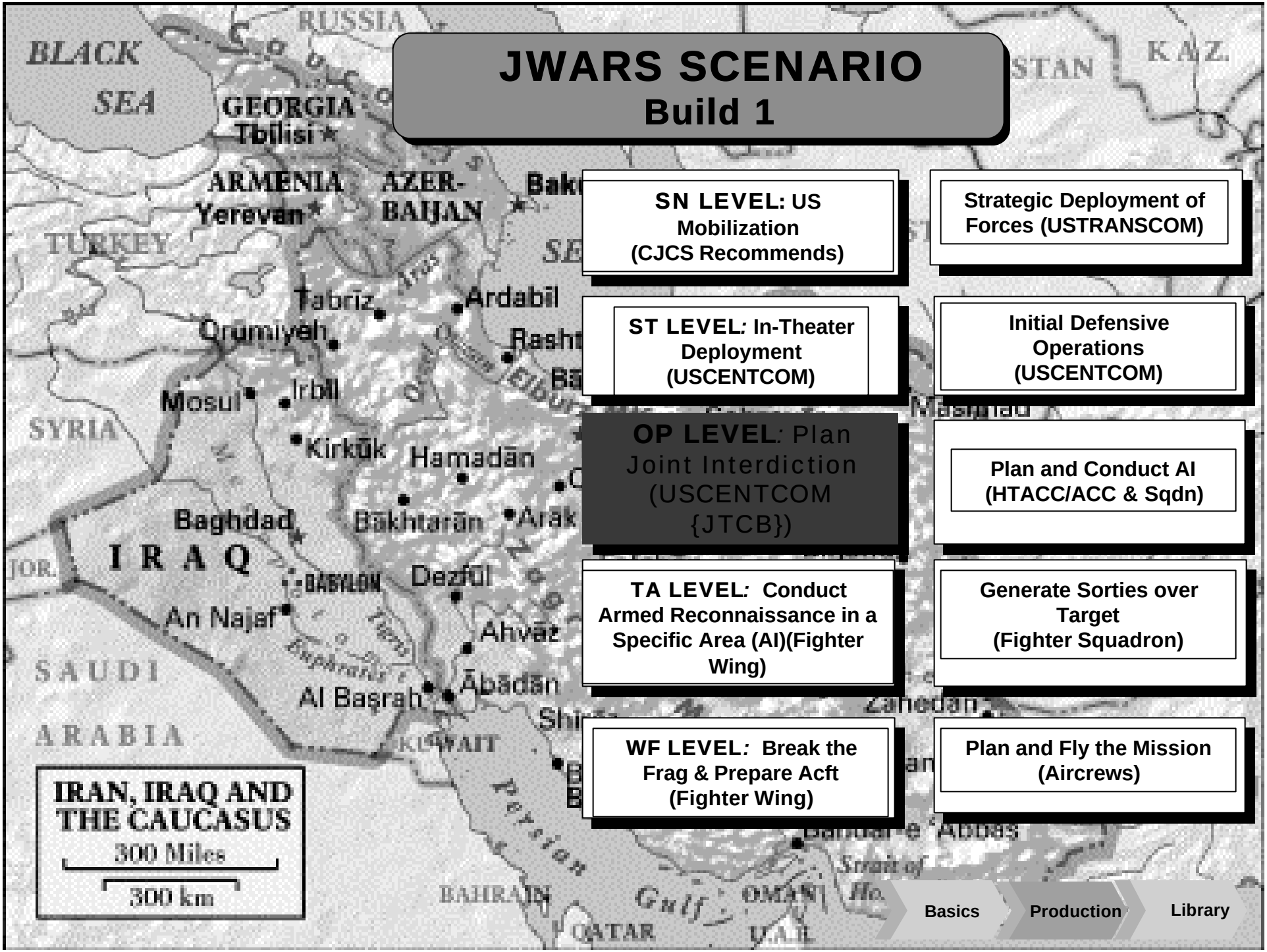
CMMS: Model Development Process

MISSION THREAD




JWARS SCENARIO
Build 1
SN LEVEL: US Mobilization (CJCS Recommends)
Strategic Deployment of Forces (USTRANSCOM)
ST LEVEL: In-Theater Deployment (USCENTCOM)
Initial Defensive Operations (USCENTCOM)
OP LEVEL: Plan Joint Interdiction (USCENTCOM {JTCB})
Plan and Conduct AI (HTACC/ACC & Sqdn)
TA LEVEL: Conduct Armed Reconnaissance in a Specific Area (AI)(Fighter Wing)
Generate Sorties over Target (Fighter Squadron)
WF LEVEL: Break the Frag & Prepare Acft (Fighter Wing)
Plan and Fly the Mission (Aircrews)
IRAN, IRAQ AND THE CAUCASUS
300 Miles
300 km
Basics
Production
Library

Level 4] - Mission Outcomes Status

Ablaze, the Arizona slips beneath the water

More US Marines won the Medal of Honor on Iwo Jima than in any other battle in US History.

In 36 days of fighting there were **25,851 US casualties** (1 in 3 were killed or wounded).

Virtually all 22,000 Japanese perished.

Measure? Avoidance

Loss Exchange Ratio (LER)

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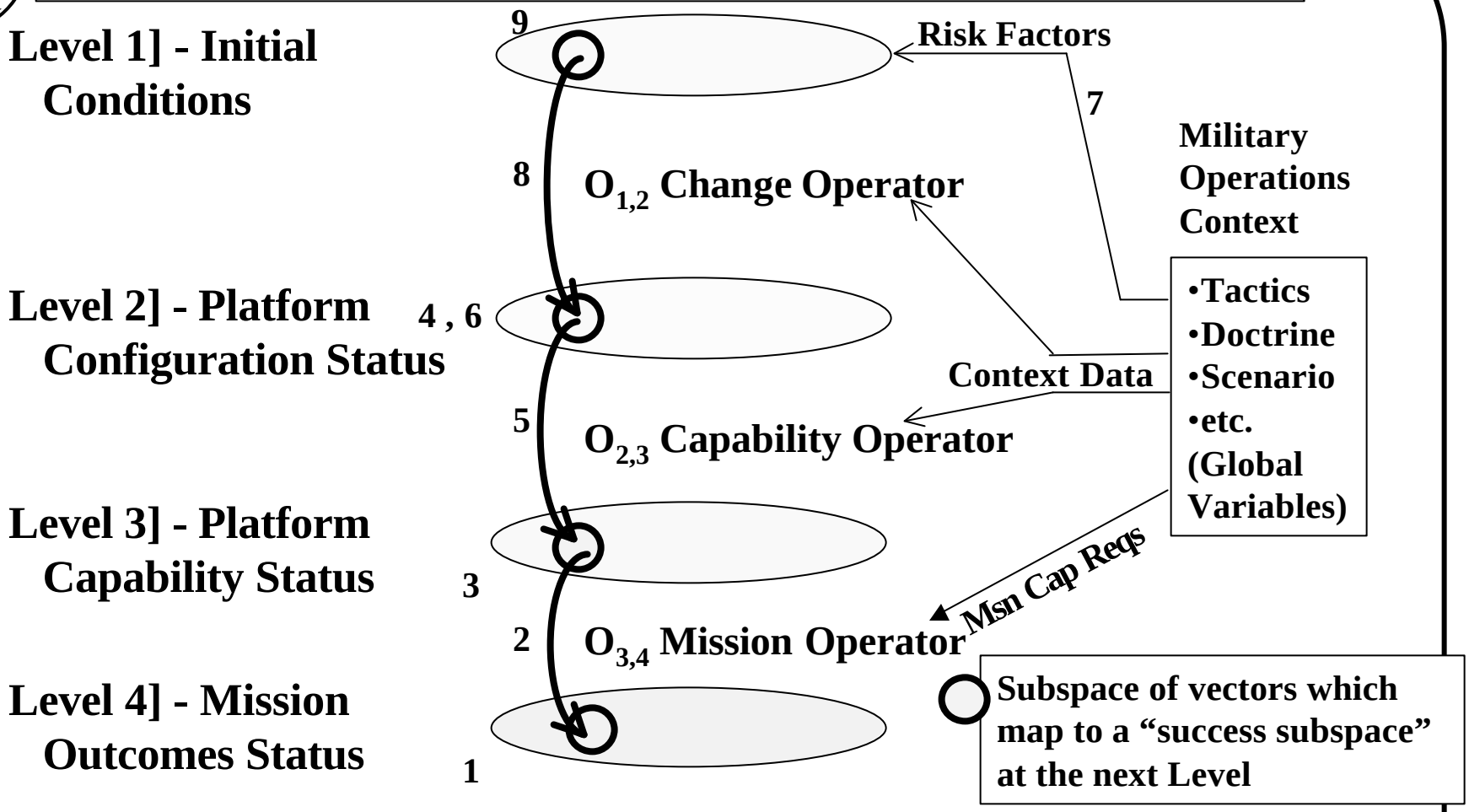
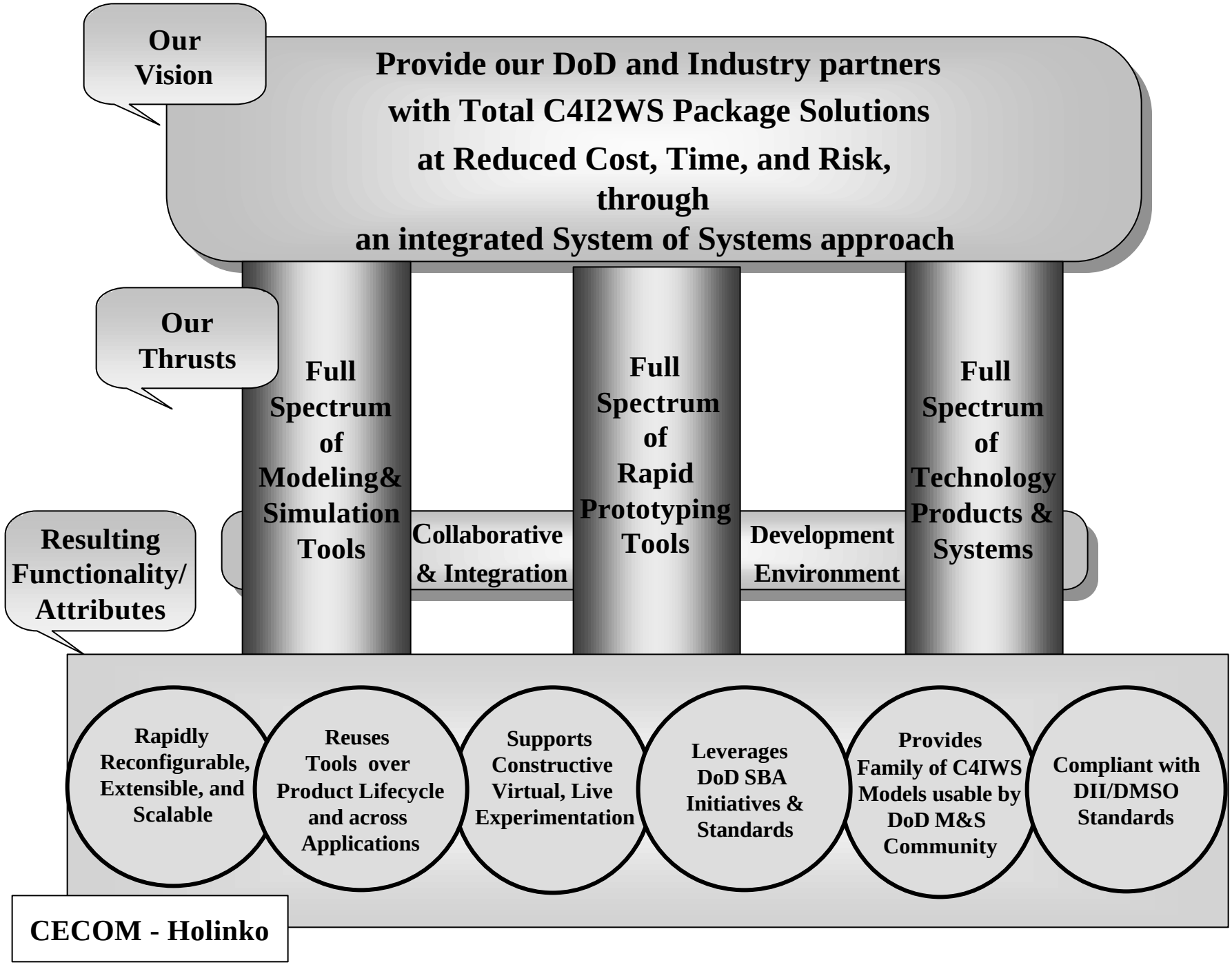
Mission-Based Acquisition Strategy



Logic Instantiation/Exercise:

1 Define Desired Mission (s) Outcomes
2 Develop Mission Mapping(s)
3 Define Mission-Relevant Capabilities
4 Develop Point Designs
5 Develop Capability Mappings
6 Estimate Cost for Each Design
7 Develop Mission-Related Risk Factors
8 Generate Required Change Operators
9 Exercise logic to: a] assess risk(s), b] estimate any change in component status, c] estimate any change in platform capabilities, d] check mission outcome(s), if favorable, e] proceed to next mission task(s) or end of mission.

The End

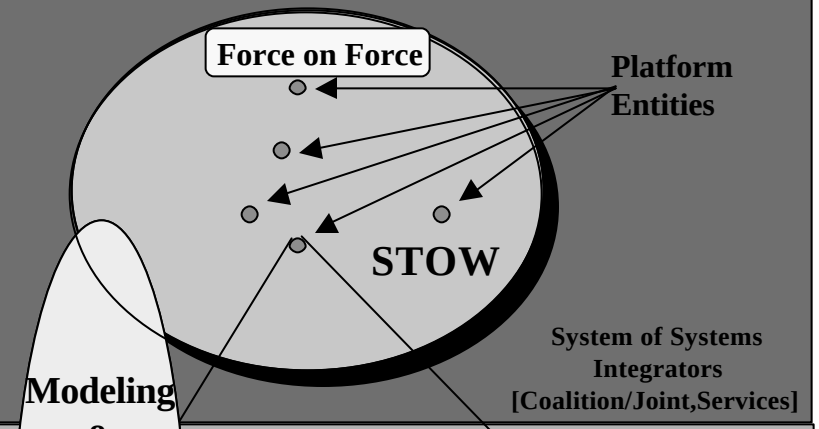

Our Vision
Provide our DoD and Industry partners with Total C4I2WS Package Solutions at Reduced Cost, Time, and Risk, through an integrated System of Systems approach
Our Thrusts
Full Spectrum of Modeling& Simulation Tools
Collaborative & Integration
Full Spectrum of Rapid Prototyping Tools
Development Environment
Full Spectrum of Technology Products & Systems
Resulting Functionality/ Attributes
Rapidly Reconfigurable, Extensible, and Scalable
Reuses Tools over Product Lifecycle and across Applications
Supports Constructive Virtual, Live Experimentation
Leverages DoD SBA Initiatives & Standards
Provides Family of C4IWS Models usable by DoD M&S Community
Compliant with DII/DMSO Standards
CECOM - Holinko

Tiers of Modeling and Simulation

Operational

Synthetic Theater of War (STOW)

Military Worth



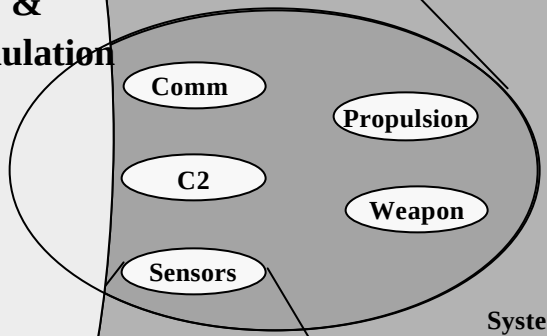
System of Systems Integrators [Coalition/Joint,Services]

System

System trade-offs
Traffic Loading

System Engineering

Modeling & Simulation

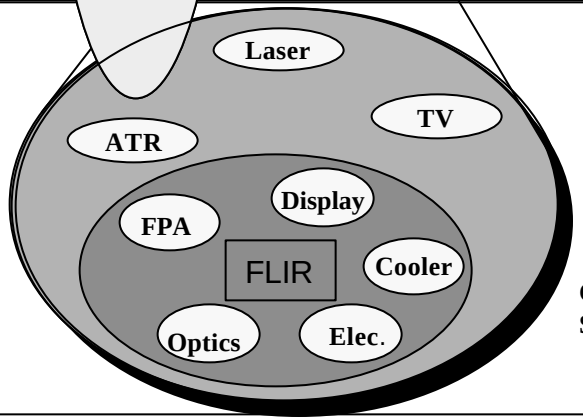


System Integrators [Services, PEOs, PMs, contractors]

Technical

Sub-system trade-offs
Engineering/ Physics

Sub-system Design, e.g., Sensor Suite



Component/Subsytem/ System Developers [PMs, RDECs, Labs, contractors]

CECOM - Holinko